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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/539,572

06/17/2005

Bertrand Viellerobe

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EXAMINER

WERNER, DAVID N

ART UNIT

PAPER NUMBER

2621

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DELIVERY MODE

08/04/2009

PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/539,572	VIELLEROBE ET AL.	
	Examiner	Art Unit	
	David N. Werner	2621	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on ____.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-24 is/are pending in the application.
- 4a) Of the above claim(s) ____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) ____ is/are allowed.
- 6) ☒ Claim(s) 1-24 is/are rejected.
- 7) ☐ Claim(s) ____ is/are objected to.
- 8) ☐ Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 17 June 2005 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☒ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. ____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|----------------------------------------------------------------------------------------|-------------------------------------------------------------------|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. ____. |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date <u>20050928</u> . | 6) <input type="checkbox"/> Other: ____. |

DETAILED ACTION

1. This is the First Action on the Merits for U.S. Patent Application 10/539,572, which is the national stage entry of International Application FR03/03687, filed 12 December 2003, and claims benefit to French Patent Application 02/16276, filed 20 December 2002. Currently, Claims 1–24 are pending.

Priority

2. Acknowledgment is made of applicant's claim for foreign priority based on an application filed in France on 12 December 2003. It is noted, however, that applicant has not filed a certified copy of the PCT/FR03/03687 application as required by 37 CFR 1.495(b)(1).

3. Acknowledgment is made of applicant's claim for foreign priority based on an application filed in France on 20 December 2002. It is noted, however, that applicant has not filed a certified copy of the 02/16276 application as required by 35 U.S.C. 119(b).

Specification

4. The disclosure is objected to because it contains an embedded hyperlink and/or other form of browser-executable code. Applicant is required to delete the embedded hyperlink and/or other form of browser-executable code. See MPEP § 608.01.

Claim Rejections - 35 USC § 103

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

6. Claims 1–15 and 17–24 are rejected under 35 U.S.C. 103(a) as being unpatentable over "New SNOM sensor using optical feedback in a VCSEL-based compound-cavity" (Gorecki et al.) in view of "Parallel confocal laser microscope system using smart pixel arrays" (Naruse et al.), cited in the 28 September 2005 IDS and described in page 1 of the specification. Gorecki et al. teaches a microscope head or sensor comprising a VCSEL laser. Regarding Claim 1, Figure 4 illustrates a cross-section of the sensor. The laser is directed at the sample on the bottom of the diagram, and is emitted through the microtip (pg. 115: column 2). Then, the VCSEL is a claimed VCSEL for emitting a light beam, and the microtip is the claimed optical means. Additionally, on the rear of the VCSEL, or the top of the diagram, the PIN detector detects backscattered light reflected off the sample and back into the VCSEL cavity (pg. 116: column 1). Then, the Gorecki et al. sensor has a photodetector arranged on a face of the VCSEL laser that receives a light beam originating from a subject via the laser cavity. The ring electrode shown in figure 4 is the claimed opening in the cavity used as a filtering hole.

Naruse et al. discloses a parallel confocal microscope, described in page 1: lines 14–31 of the specification as representative of the art. Regarding claim 1, figure 1 of

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Naruse et al. illustrates the microscope, comprising an array of VCSEL elements, each providing a light source onto the specimen that is backscattered and detected at the photodetector array. Since in this case multiple "smart pixels" are processed in parallel, as opposed to the single pixel processed by the single photodetector in Gorecki et al., real-time scanning can be performed (pp. 95–96).

Gorecki et al. discloses the claimed invention except for an "array" of lasers producing a plurality of "light beams". Naruse et al. teaches that it was known to use an array of VCSEL components to facilitate parallel processing. Therefore, it would have been obvious to one having ordinary skill in the art at the time of the present invention to modify the microscope head of Gorecki et al. to use an array of elements, as taught by Naruse et al., since Naruse et al. states in pages 95–96 that such a modification would allow for real-time imaging.

Regarding Claim 2, as shown in figure 4 of Gorecki et al., the cavity opening of the VCSEL is positioned on the bottom of the laser, and the PIN detector is positioned on top of the laser, or opposite the cavity opening.

Regarding Claim 3, in Gorecki et al., the VCSEL-based sensor is designed to be mounted on a "scanning piezoelectric cantilever" (pg. 122: column 2) or "positioner" that moves the sample (pg. 116: column 2; pg. 118: column 1).

Regarding Claim 4, the multiple VCSEL sensors in Naruse et al. are specifically designed to facilitate real-time imaging (pg. 96).

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Regarding Claims 5 and 6, both Gorecki (pg. 116: column 2) and Naruse (figure 6) specify that the specimen is mounted on a piezoelectric stage, commonly considered to be a Micro-Electro-Mechanical Systems (MEMS) component.

Regarding Claims 7 and 8, in Naruse et al., the scanning process may be embodied as a process of moving the "optical system" so that the entire specimen is covered (pg. 95).

Regarding Claims 9 and 10, in Gorecki et al., the microtip is described in page 116: column 1 as back-scattering reflected light from the subject through the VCSEL cavity to the PIN detector, and causing a "power modulation" of light energy with the sample surface.

Regarding Claim 11, in Naruse et al., the array of plural photodetectors is the claimed "synchronous detection means".

Regarding Claims 12 and 13, when the microscope is embodied so that the apparatus moves over a stationary specimen during scanning, then the microtip of Gorecki et al. is the claimed lens that allows for image acquisition at different depths.

Regarding Claim 14, Gorecki et al. describes an experimental setup in which the "z-scan" or distance between the VCSEL and subject is variable (pg. 118: column 1).

Regarding Claim 15, in Gorecki et al., the IC microhead comprising the PIN detector, laser, and microtip is the claimed "minature head in the form of a housing".

Regarding Independent Claim 17, in Gorecki et al., a VCSEL laser performs the step of emitting a light beam. A microtip performs the claimed step of focusing the light

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beam on an object to be observed. A PIN detector performs the claimed step of receiving a light beam via the VCSEL cavity. A ring electrode performs the claimed step of filtering. By producing multiple instances of this sensor in an array, as in Naruse et al., the "plurality" of light beams is emitted.

Regarding Claim 18, Naruse is described as scanning the specimen by either moving the specimen beneath a stationary device or moving the device over a stationary specimen (pg. 95).

Regarding Claim 19, the multiple VCSEL sensors in Naruse et al. are specifically designed to facilitate real-time imaging (pg. 96).

Regarding Claims 20 and 21, in Naruse et al., in Naruse et al., the scanning process may be embodied as a process of moving the "optical system" so that the entire specimen is covered (pg. 95).

Regarding Claims 22 and 23, both Gorecki (pg. 116: column 2) and Naruse (figure 6) specify that the specimen is mounted on a piezoelectric stage, commonly considered to be a Micro-Electro-Mechanical Systems (MEMS) component.

Regarding Claim 24, in Gorecki et al., the microtip is described in page 116: column 1 as causing a "power modulation" of light energy with the sample surface. Additionally, the array of VCSELs in Naruse, modified to contain the backing photodetectors of Gorecki et al., carry out "synchronous detection" at the photodetector level.

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7. Claim 16 is rejected under 35 U.S.C. 103(a) as being unpatentable over Gorecki et al. and Naruse et al. as applied to claim 15 above, and further in view of "Simple reflection Scanning Near-field Optical Microscope using the back reflected light inside the laser cavity as detection mode". Claim 16 is directed to placing a miniature head at the end of an endoscope. Gorecki et al. and Naruse et al. do not disclose this embodiment.

Schwarz et al. teaches a laser microscope similar to that in Gorecki et al. Regarding Claim 16, in Schwarz et al., as shown in figures 2, 3, and 5, the laser is connected to one end of an optical fiber, with the other end of the fiber, or tip, held near the sample (pg. 303: column 2). Then, Schwarz et al. can said to place a head at the end of an endoscope.

Gorecki et al. in combination with Naruse et al. discloses the claimed invention except for using an endoscope. Schwarz et al. teaches that it was known to place the tip of a laser microscope at the end of a fiber. Therefore, it would have been obvious to one having ordinary skill in the art at the time of the present invention to modify the microscope of Gorecki et al. to use the fiber of Schwarz et al., since Schwarz et al. states in page 303: column 2 that such a modification would enable fine control of the head near the sample.

Conclusion

8. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. "A Cavity-SNOM (Scanning Near-field Optical Microscopy) Head

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Using a Laser Diode" (Ito et al.) teaches a microscope with a photodiode mounted behind the laser diode, similar to that in Gorecki et al.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to David N. Werner whose telephone number is (571)272-9662. The examiner can normally be reached on Monday-Friday from 10:00-6:30.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Mehrdad Dastouri can be reached on (571) 272-7418. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/D. N. W./
Examiner, Art Unit 2621

/Dave Czekaj/
Primary Examiner, Art Unit 2621